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Memo

date: *January 30, 2009*

to: *RSC*

from: *D. Beavis* DB

subject: *Chipmunk Data for Thompson Road*

The RSC had requested[1] chipmunk data before making a final decision for the status of Thompson Road. B. Martin has provided a listing[2] of chipmunk alarms, interlocks, and the chipmunk dose rate data[3] for Run 6, 7, and 8.

The data on interlocks provided by B. Martin was examined and the following table resulted. I used somewhat different criteria than B. Martin on classifying interlocks on chipmunk NMON216 and NMON237 (Y arc) which are daisy chained together and the same is true for NMON217 and NMON238 (X Arc). The number of interlocks were:

RUN	X-Arc	Y-Arc
06	6	7
07	0	5
08	7	28

On examining the actual chipmunk data it appears that most of these interlocks correspond to an increase in dose rate monitored by the chipmunk before it terminated the beam. Typically it was found that these interlocks corresponded to an increase of 0.3 mrem/hr in a five-minute time bucket. This corresponds to a net dose increase of 0.03 mrem. It was not clear why so many interlocks occurred in run 8, but clearly the dose in the area is being reduced by the chipmunk interlock function.

One example of a chart of the dose rates provided by B. Martin is shown in figure 1. The large spike on April 5, 2007 is not real. There was no interlock. The OC logs were consulted and it was found that there was no beam being injected into RHIC. RHIC had a store in progress. This appears to be an issue with infrequent corruption of the data. Several other examples of spikes above the interlock level were found with no corresponding interlock. A 12 mrem/hr spike for one five-minute time bin corresponds to 1 mrem of dose. As can be seen from Figure 1 essentially the entire time the dose rate is below 0.5 mrem/hr. Figure 2 shows the end of run 07 and that most of the time the chipmunk is near or at background.

The number of occurrences in run 07 with a chipmunk level above 0.3 mrem/hr in a five-minute time bin was 12 for NMON216 and 8 for NMON217. On the average the dose rate is much lower than 0.3 mrem/hr. We can use this as a conservative upper limit to the dose rate for a person walking across Thompson Road over the transport beam line. If one assumes a person is there for 3 minutes of time, that the person does this once per day, and the run is 150 days in duration, then the dose to that person would be 2.25 mrem. It is concluded that it is unlikely that a person would receive 25 mrem in this area for an operating year.

It is therefore proposed to make Thompson Road an uncontrolled area with the changes proposed in reference 4.

References

1. RSC Minutes of Nov. 20, 2008.
2. B. Martin e-mail to D. Beavis, Jan. 5, 2009.
3. B. Martin e-mail to D. Beavis, Jan. 7, 2009.
4. D. Beavis memorandum to RSC, " Proposed Changes to the Radiation Protection of Thompson Road", Nov. 18, 2008

Alarm/Interlocks

Dose Rate:
Run FY06
Run FY07
Run FY08

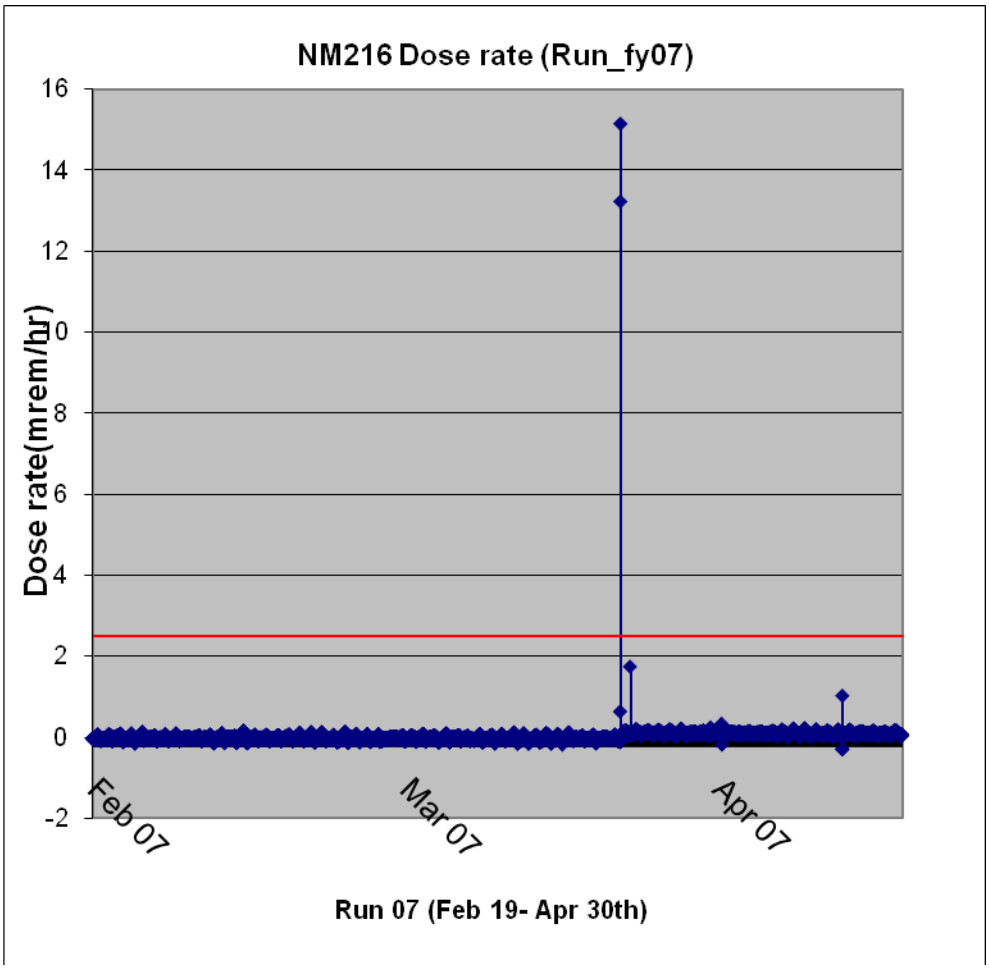

Figure 1: The same plot with the data without zero suppression.

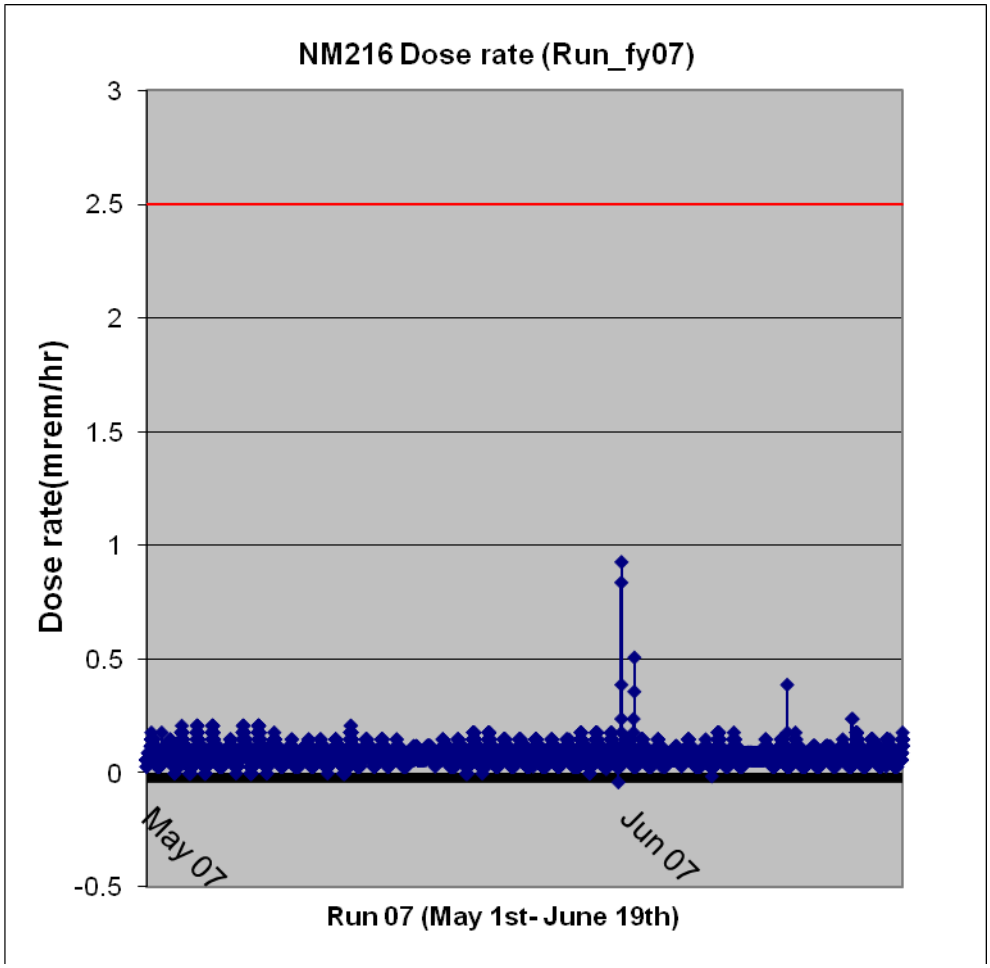

Figure 2: The last two months of run 07.